REPORT

of the

FOURTH SOUTHERN PASTURE AND FORAGE CROP IMPROVEMENT CONFERENCE

April 22 - 25, 1947

Florida Agricultural Experiment Stations
Quincy and Gainesville, Florida

Reported by

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FOURTH SOUTHERN PASTURE AND FORAGE CROP IMPROVEMENT CONFERENCE
Quincy and Gainesville, Florida, April 22 - 25, 1947

Tuesday, April 22

9:00 a.m. - 12:00 m. Assembly Hall Experiment Station

W.H. Bennett, Chairman
Roland McKee, Acting Secretary

I. Introduction

The Conference was called to order by Chairman W. H. Bennett at 9:00 a.m. in the Assembly Hall of the Experiment Station. All in attendance were introduced by states. Total attendance at the morning session was 56. Concluding a short introductory talk, Chairman Bennett introduced Mr. J. D. Warner, superintendent of the West Florida Experiment Station, who welcomed the Conference delegates and gave a short statement regarding the Station and the general work in progress.

II. Trip Around West Florida Experiment Station

The morning was then spent looking over the work of the Station. Dr. Kincaid first showed the work being done with shade tobacco. One pound of uramon or 1/2 pound of cyanamid per square yard or a combination of both is being used for weed control.

Mr. Warner next called attention to severe damage being done by Helminthosporum to oats being grown in rotation with tobacco. The general oat breeding nursery was visited next with Mr. P. W. Chapman explaining the objectives of the work. Both seed and forage varieties are being grown. Breeding is mainly for resistance to Helminthosporium. The varieties Clinton, Bonda, and Benton are considered most resistant to H. victoriae.

Lupine nursery work was presented by R. C. Bond. Bitter and sweet white lupine, bitter and sweet blue lupine, and sweet yellow lupine are included in the nursery. A large number of types have been selected in bitter blue lupines in particular, with strains being differentiated largely on size of growth.

Mr. Warner next showed Dixie crimson clover that had volunteered a fair stand the second year from seed production on a field that was in corn in 1946 and had been in crimson clover for 4 years preceding, then followed by sorghum. Black medic, planted in rows for seed increase, has made a good growth. This if from seed selected at Gainesville from Florida naturalized stands.

Pasture fields were next inspected. The first field was one in which centipede grass was being eradicated or controlled. This was accomplished

by first thoroughly disking the centipede sod in late summer or fall for the planting of blue lupines. The lupines which are grown through the winter months were followed by a summer crop of cowpeas which in turn was followed by fall-seeded oats. This was the winter of 1945. The field was then seeded with 25 pounds of common and Pensacola bahia grass, lespedeza, and ball clover. In the winter of 1945, the carrying capacity of this pasture, as given by Mr. Baker, was 25 yearlings from November through February. The gain on the winter oats was 314 pounds per acre. Fertilizer used was 400 pounds of 0-14-10 and 2 tons of lime. In 1946 cattle were on the pasture from June on and made a gain of 120 pounds. Kudzu being used to supplement pasture gives yields of 1-1/2 to 2 tons of hay per season. A crimson clover pasture of 7 acres with fourth year of volunteer crimson clover had an excellent stand. This carried 20 cows and 20 calves for 4 weeks. Another crimson clover pasture being pastured by sheep was seeded in oats in the fall of 1946. Volunteer crimson clover in the oats gave a dense stand. The crimson clover will be allowed to seed and the land then prepared for pearl millet. This then will be again followed with oats and volunteer crimson clover.

A field of crimson clover on virgin land had practically no stand or growth where no fertilizer was used. Five hundred pounds of 20 percent superphosphate plus 100 pounds of potash and one ton of lime gave near maximum results. Various fertilizer rates were used in this experiment. Crimson clover was being volunteered on Bermuda sod pasture with a good stand from locally grown crimson clover seed and a fair stand from seed from Georgia.

III. Tuesday Afternoon Session
Problems Relating to Harvesting and Storing Lupine Seed

At 1:30 p.m. the Conference again met in the Experiment Station Assembly Hall to discuss problems relating to harvesting and storing lupine seed. The general problem was presented by Mr. Roland McKee. It was pointed out that lupine seed does not ripen entirely evenly, and at time of harvest some of the seed may contain as much as 30 percent moisture. In 1946 climatic conditions were unfavorable to seed drying, and many lots of seed in storage were greatly reduced in viability within four months, or at time of fall planting. The problem is to get the seed properly dried at harvest time and to maintain low moisture during storage. Attention was called to the fact that in the South the atmospheric humidity is usually high during the summer months when the temperature is high, and that high humidity and high temperature result in rapid deterioration of seed viability. Laboratory studies show that seed with 15 percent moisture, when kept at a temperature of 85°F., decrease in viability very rapidly. Studies relating to change of moisture content in seeds have shown that lupine seed, when exposed to the open air, takes up and loses moisture rapidly with changes in atmospheric humidity. Over one percent change has been recorded for a day, and 5 percent change for the season at Washington, D. C., and 7 percent for Gainesville, Florida. Seed in warehouses and in large bulk would no doubt have much narrower range but would be subject to some change. Data on this point are needed.

Moisture determinations of lupine seed in storage in the South during the winter of 1946-47 showed a range of moisture content of the seed ranging from 12 to 17 percent, and a germination ranging from 5 to 90 percent, with most of the lots below 50 percent. It is known that seed with low moisture content will retain viability for a long period of time, even though the temperature may be somewhat high, but when the moisture content is high, as is the case with seed under average conditions in the South, it is necessary to have low temperature or the seed will lose viability rapidly. The conclusion is that it is necessary to reduce the moisture content of lupine seed immediately after harvest and by some means maintain the moisture content at not more than 12 percent if the seed is to retain good germination beyond the first season. How best to accomplish this is the problem.

Dr. Phares Decker next discussed seed treatments by fungicides and heat in relation to viability of seed. He pointed out that treatment of seed in the laboratory with fungicides has given fair results but that poor results have been obtained in the field. This relates to seedling diseases and obtaining stands. The effect of heat in drying seed subsequent to harvest was studied by using seed with 10, 14, and 25 percent moisture. Seed with 10 percent moisture was not injured when kept for days at 110°F. Seed with 14 percent moisture was not injured by 130°F. when dried rapidly. The same was true of seed with 25 percent moisture. Dr. Decker pointed out that at the higher temperature there seemed to be some inducement of hard seed.

Bill Womack of Ashford, Alabama, a large grower of lupines, discussed his method of harvesting and handling lupine seed. The crop is harvested with a combine. The seed is then screened to separate large high-moisture content seed from the drier seed. The large seed amounts to about 5 percent. All the seed is then dried with artificial heat, using a column type drier. Mr. Womack considers artificial drying of the seed essential.

Stuart Simpson of Monticello, Florida, another large grower and seed dealer, stated that he dries all his lupine seed down to 10 percent moisture. When thus dried, he has had no difficulty in keeping the seed through the first season. He first used a baffle type drier but now uses a table type drier, drying the seed in sacks. Mr. Simpson considers artificial drying essential, and, according to his experience, seed dried to 10 percent will retain viability for the first year with good storage.

Mr. J. W. Simons, a research engineer of the USDA, discussed seed driers and handling seed in storage. He showed slides of experimental driers at the Athens, Georgia, laboratory and one being used in Texas. Slides were also shown of commercial driers. He pointed out that seed should be cooled to atmospheric temperature before storing. Wheat stored at 80°F. was reduced in viability 5 percent in 10 days; at 90°, 10 percent; at 100°, 20 percent; and at 103° the loss was 25 percent. He further pointed out that seed should be stored on wood floors, never on concrete. Harvesting early in the day to prevent shattering may increase moisture in the seed. Early morning harvested wheat contains more moisture than wheat harvested later in the day.

Gainesville, Florida
Wednesday, April 23

10:00 a.m. - 12:00 M. — W. H. Bennett, Chairman
IV. Introduction — G. E. Ritchey, Act. Secretary

The opening of the Conference was preceded by registration of those present.

At 10:00 a.m. the session Conference was opened by the Chairman, Mr. H. W. Bennett, who called upon Director Mowry of the Florida Agricultural Experiment Station. Mr.Mowry reviewed briefly the importance of the livestock and forage industry of Florida, and extended a welcome to all delegates. The director also extended an invitation to all to use the Experiment Station and its facilities at any time they wished.

Dr. G.B. Killinger, acting in the absence of Mr. W. E. Stokes, announced the plans of the Conference, including a banquet for Wednesday evening at which election of new officers would be the item of the evening.

Dr. A. L. Shealy, Head of the Department of Animal Industry, was called upon to welcome the delegates. Dr. Shealy emphasized the importance of cooperative work between the Animal Industry and plant workers. He gave a brief history of the cattle industry of the State of Florida, and emphasized the fact that the development of the cattle industry has grown hand in hand with the grass and pasture work.

Dr. Killinger added to Dr. Shealy's remarks by explaining that 15 to 20 million acres of poor types of soils were available for development, and that many of these lands will make good pastures with proper fertilization and management.

Chairman Bennett called for an introduction of members of the Conference by states.

Dr. G. W. Burton moved that a resolution be presented to Mr. W. E. Stokes, expressing our regrets that he was ill and unable to be with the group. This was approved and Dr. Burton was appointed by the Chairman to draw up such a resolution and present it to the Conference for signatures. He presented the notice of the regrets of the group and it was signed by 58 members.

V. Hay Curing

Mr. R. B. Davis, Bureau of Plant Industry, Soils, and Agricultural Engineering, who is cooperating with the Agricultural Engineering Department of the Virginia Agricultural Experiment Station of Blacksburg, Va., presented the subject of "Conserving Harvested Forage -- Barn Curing of Hay" as a substitute for Dr. T. M. Jones who was unable to be present.

Mr. Davis explained that in natural curing large amounts of digestible nutrients are lost. Studies have been made at the Virginia Station and the Agricultural Engineering Department staff has assisted approximately

350 farmers to install equipment in their barns. The objects of drying are: (1) Retain quality of the hay; (2) Save from loss of leaves, etc.

Two general types of forced air driers are under study:

(1) Lateral duct system.
(2) Slatted-floor drier with and without supplemental heat.

(a) Chopped hay.
(b) Longer whole hay.

In the case of the forced air system, it was found that best results were obtained when the green material was moved in at about 40 percent moisture content. Hay is piled evenly and uniformly over the system and air is forced up through the hay.

Problems encountered in lateral duct system are as follows:

(1) Air distribution is not uniform.
(2) Turns in duct slow up the flow of air and cause excessive pressure loss.

An explanation of the slatted-floor system was given. A false floor of slats or narrow boards is built 4 to 6 inches above the main floor. Hay is piled on the slatted floor and air is forced through the hay. This air may or may not be heated.

A research installation was explained. Two bins were constructed. One bin was filled with long hay, the other with similar hay chopped. Very little or no difference in the space occupied by the chopped and long material was observed in several comparative tests. Slightly less pressure was required to force air through the chopped hay. Cost of drying favors chopped hay over long hay. Quality of hay produced favored that of the long hay. The advantage in each comparison was very small. Supplemental heat improved the quality of the hay.

Tests showed that cost of operation variations were $1.52 per ton to $2.38 per ton to dry hay from 50 percent moisture content to safe storage with heat, and $2.00 to $2.25 per ton without heat. Total cost with heat was more because of higher investment costs. Hay drying equipment costs 40 to 50 cents per square foot of mow, without heating system.

Analysis of hay shows protein slightly higher in hay dried with supplemental heat; dry matter loss 5 percent greater when field cured; protein loss 5 percent less in barn-cured than in field-cured.

Dr. T. J. Smith from the Virginia Agricultural Experiment Station substituted for Dr. C. W. Holdaway who was unable to be present. Dr. Smith emphasized the importance of hay drying in Virginia. Virginia farmers

usually encounter bad haying weather at time of the first cutting, and it is unusual to have three days at a time without moisture of some kind. Artificial hay drying is especially important for dairymen of the Southeast.

There was no discussion due to lack of time before lunch.

Wednesday Afternoon Session
VI. Field Trip Around Experiment Station

1:30 p.m. The members of the Conference assembled in Room 404, Newell Hall, from where they left on a motorcade over the Experiment Station Farm in 19 cars, with Dr. G. B. Killinger in charge.

Stop 1. Mr. G. E. Ritchey pointed out plots used in the adaptation program in part they were as follows: Plots planted in corn following late and early hairy indigo and crotalaria as compared with natural summer cover. Third year stubble of a new strain of sorghum volunteering; test plots of the early hairy indigo;and Napier grass strain test.

Stop 2. Dr. F. H. Hull explained the presence of white bud in corn, and its characteristics and treatment were discussed. Mr. Ritchey briefly explained that winter cover crops followed by corn produced more than five times as much corn as was obtained on plots growing no winter cover crop.

Stop 3. Dr. Henry C. Harris of the Department of Agronomy, University of Florida, explained what seemed to be a nutrient deficiency in No. 167 oats. The symptoms have occurred for the last four years. Dr. Harris showed some plots which suggested that the lack of copper is responsible for the trouble.

Stop 4. Mr. G. E. Ritchey explained that Lotus uliginosus was inoculated and seeded on a heavy centipede sod. A good stand was obtained.

Stop 5. A study was made of big flower vetch, Augusta vetch, and rough pea plots which had been seeded on the surface of a heavy mixed carpet, centipede, Bermuda, and Bahia grass plot. A good stand of all of the legumes are now on the plots. A heavy growth of Lotus uliginosus is growing on the edge of a lake which was seeded on top of the ground in 1945.

Stop 6. The introduction garden was explained by Mr. Ritchey, and several types of grasses and legumes were discussed.

Stop 7. Dr. G. B. Killinger explained that duplicate pastures, each of Bahia grass, Bermuda grass, and Pangola grass, were under test on six 2-1/2 acre areas. (See tables which were distributed for grass yields and cattle gains). Pastures were grazed alternately.

Stop 8. Dr. Killinger explained the clover, carpet-grass pasture set-up. Duplicate pastures of unfertilized carpet grass, of fertilized carpet grass and clover, and carpet grass pastures are being used in the set-up. (See tables which were distributed giving cattle gains).

While on the carpet-clover pastures, Dr. Killinger called upon Dr. R. S. Glasscock, Animal Husbandman, for a few remarks. Dr. Glasscock explained the pasture research development as it is related to livestock, and stated that it is futile to attempt to separate the two phases of the work.

Dr. R. B. Becker was called upon. Dr. Becker discussed the development of the Pasture Measurement Committee and the steps in the development of different techniques and systems of pasture managements. He explained the need for more thought to be given to this subject.

Wednesday Evening Session
VII. Business Meeting

The members of the Conference met in the banquet room of the Hotel Thomas. After dinner several items of business were transacted. Two members of the Executive Committee were elected, Mr. T. J. Smith of Virginia for the 1950 term, and Mr. O. E. Sell of Georgia for the regular four-year term, ending 1951. An invitation from the Mississippi Agricultural Experiment Station to hold the 1948 meetings in StateCollege, Mississippi, was read, and the invitation was accepted. Mr. George Warner of Texas was elected Chairman for 1948. After several announcements, the evening meeting was adjourned.

Thursday, April 24

VIII. Uniform Testing of Improved Grasses in the South.

8:30 A.M. - 12:00 M.

W. H. Bennett, Chairman
G. E. Ritchey, Acting Secretary

The discussion of uniform testing of improved grasses in the South was led by Dr. G. W. Burton.

Inasmuch as the grass breeding program isproducing new strains which show promise and no organized means of determining their limitations is in existence, a need for uniform nurseries is felt,in order that the new strains may receive wider testing. The system used by oat and corn breeders was explained as illustration of how the project may work. Dr. Burton asked how many felt that the uniform grass nurseries would be desirable, and most hands were raised. The question raised several questions from the floor:

1. What should be the nature of the tests?
2. What should be the criteria used in determining what should go into the tests?

3. How did the oats strain tests work?
4. Will species differences or strain differences be included as test criteria?
5. How will this fit into the introduction, or must it be separate?

Dr. Fergus of Kentucky suggested that the system should be simple and so organized that results will be obtained quickly and not drawn over a period of several years.

Dr. Burton listed important factors to be determined in the test as follows:

1. Survival -- in any territory of first importance.
2. Production.
   (a) total
   (b) seasonal
   (c) under special uses
   (d) at one or more fertility levels
3. Evaluation of quality.
4. Protein analysis.
5. Necessity of measuring ability of grass to associate with legumes. (Mr. Hein suggested this)
6. Palatability.
7. Control -- as related to different localities.
8. How will cattle react to it?
9. Diseases

It was suggested that all plants be grouped by genera or by species. A general discussion followed regarding the plan. Dr. T. J. Smith moved and the motion was seconded that a committee be appointed to make a study of the program of uniform nurseries and prepare specific recommendations. The motion was carried.

Mr. Paul Tabor requested the privilege of making a few remarks. He suggested that judgment of the worker must be based on experience and the ability to analyze his observation with plants before he is willing to allow his material to go out to the public. He pled that we not get into too big a hurry to release the material.

Dr. Roy L. Lovvorn of North Carolina State Experiment Station emphasized the importance of more extensive tests, and suggested that it is important that the regional limitations be determined for each of the new grasses and other pasture plants.

Mr. Paul Tabor of the Soil Conservation Service discussed, "Production and Maintenance of Foundation Seed Stocks of Improved Forage Varieties," in the absence of Dr. H. W. Wellansen. He introduced the subject with illustrations of the history of the development of the annual lespedezas in Japan, showing how a large important strain developed in Japan was

brought to America and lost. Another illustration was the selected strains, Tennessee 76, which has been lost as a pure variety. Another illustration was the Suwannee Cow Pea.

Mr. Tabor asked what could be done to keep up the supply.

Dr. E. A. Hollowell explained the move by the National Research Council to preserve genes of plants.

Mr. Tabor brought up possible methods of maintaining seed stock.

George Warner stated that seed companies in Texas expect the Experiment Station to maintain foundation seed stocks.

Mr. Tabor asked the following questions:

1. Will organizations assume the responsibility of maintaining pure material?
2. Will it be well to have a regional or national depository?

Dr. E. A. Hollowell was called upon in place of Dr. H. W. Wellhausen who was unable to be present. He stated that lessthan one percent of forage plant seed on the United States market is of superior strains. He also stated that in addition to the duty of the plant breeder to develop superior strains, he should see that seed is made available to the farmer in a pure condition. He presented the many problems involved, stressing foundation seed stocks and the inadequacy of stocks.

Dr. Fergus was called upon to discuss the problems of getting Kenland red clover on the market.

Dr. Burton was called upon to discuss difficulties he had had in keeping Tift Sudan pure, and the problem of increasing it when yields of seed were less than the common varieties.

Dr. Hollowell explained the work which is being done on white clover, and presented the question, how can new strains be kept pure? No solution was offered. He also emphasized the need for good crop improvement associations with an organization which will work on the basis of adequate seed and seed inspection.

Mr. J. Lee Smith explained the problem of the Dixie Runner Peanut and how they are attacking the problem of the pure seed maintenance.

Thursday Afternoon Session
IX. Trip to Pasture Plots

The Conference met at 1:30 p.m. and proceeded to the pasture plots located 10 miles north of the University.

Dr. G. B. Killinger explained the burning experiment. The burning of woods in July and August cut down the regrowth of wire grass, but when burned in the autumn, winter, or spring, the wire grass made good growth. By seeding white clover, lespedeza, carpet grass, and Pensacola Bahia grass after the burning and fertilizing with phosphate, potash and giving an application of two tons of lime, a good stand was obtained. When burning was done in July and August, very little native grass was to be seen on the plots, but a heavy stand of native grasses was found on plots burned in autumn and winter. Cattle do not have free access to the plots, but are allowed in at intervals.

Dr. J. R. Neller explained an experiment on clover-grass phosphate source treatments. White clover, carpet grass, and Pensacola Bahia grass were seeded on the area. White clover predominated in full bloom.

Dr. Killinger explained the grass-clover set-up. White clover is growing with various grass types on the flat, cut-over pine land. Sweet clover strains are showing wide variations, and it is evident that there is room for selection of strains on the basis of variations. An interesting strain of white clover which appeared on the field is being increased for seed.

The group went to several areas on Mr. W. F. Williamson's pastures where he had clovers growing.

Friday, April 25

X. Callahan - Dinsmore Trip

Dr. G. B . Killinger escorted the men from North Carolina and Virginia on an inspection trip to the Pinebreeze Pullet Farm near Callahan, and the Dinsmore Dairy near Jacksonville, Florida. Clover plantings were observed with all clover in full bloom, and the farms visited had more clover than could be utilized by the animals at hand. Mr. Lawrence Irvin pointed out the practices followed on his poultry and beef cattle farm, while Mr. V. C. Johnson explained the pasture set-up on his place. Mr. Irvin's farm is claimed to be the largest poultry farm south of the Ohio and east of theMississippi River, while Mr. Johnson claims more registered Guernsey milk cows than any other dairyman in the South.

XI. Olustee Trip

Mr. George E. Ritchey accompanied a group of ten members of the Conference to thePiney Woods set-up on the Olustee Experimental Forest near Lake City, Florida. Mr. Robert McCulley, superintendent in charge of the station,

joined the group. Mr. McCulley discussed the forest station, and explained the objectives of the work in the forest as it is related to livestock.

Mr. Ritchey explained the Piney Woods experiment after which a tour was made plot by plot over the area. Special interest was shown in the plots of Kobe lespedeza, Lotus uliginosus, Rescue grass, and those on which mixtures were seeded.

Following is a brief statement of the artificial revegetation work being done at this station:

SUBJECT: ARTIFICIAL REVEGETATION OF FORESTS WITH FORAGE CROP PLANTS WHICH ARE ADAPTED TO THE FORESTS. COOPERATIVE - B.P.I.S. & A.E.; F.S., U.S.D.A. and Fla. Agri. Exp. Sta. Trial Nursery on Oulstee Experimental Forests,

OBJECTIVES as set forth by a committee which met at Tifton, Georgia, June 1945, to consider plans of the project.

"The primary objective of the piney woods reseeding project is the improvement of forage values and the resulting grazing capacity of wooded areas in the South, devoted primarily to the production of forest crops. This would be attained through: (1) introduction, improvement, development and seed increase of better grasses, legumes, and other forage plants suitable for reseeding forest range; (2) the determination of their adaptation to such lands; (3) the formulation of practical methods of their establishment on forest ranges; and (4) finally, once satisfactory stands are established, determination of best methods of management."

LOCATION AND AREA. An area was selected which is located along the south border of the Forest. It is sufficiently large to allow two areas of an acre each to be used for the nursery. The area is cut over pine land comprised of Leon fine sand with a layer of hard pan in the center of it and Leon fine sand without a hard pan surrounding the area.

Outstanding natural vegetation is Wire grass (largely Aristida stricta Michx.) Gall berry (Illex glabra (L)), saw palmetto (Serenoa repens (Bartr.)), Cyanococcus sp., and scattered sapling plants of slash and longleaf pines.

PLANS FOR THE EXPERIMENT. Grasses and legumes which have been grown in the nurseries at Gainesville, Florida, and elsewhere which have shown characteristics that may make them adaptable to wooded areas were selected for testing in the Forest Nursery.

Each strain of plant used in the test is to be planted in four plots: (1) on prepared seedbed and fertilized; (2) on prepared seedbed and not fertilized; (3) on burned over land and fertilized same as one except not cultivated; and (4) on burned over land and not fertilized. Plantings will be made as nearly in season as possible.

The plots are to be kept fenced until the plants have become established, then as soon as practicable the gates shall be opened and the cattle allowed to graze at will. Mr. McCulley stated that cattle would be in the surrounding area from March to December each year.

Plots 11 x 45 feet were laid off. One end 11 x 22½ feet was fertilized with a 5-7-5 fertilizer and the opposite end, 11 x 22½ feet, was left unfertilized. The fertilized end also received an application of 1500 pounds of hydrated lime per acre.

XII. Projects Under the Agricultural Marketing and Research Bill.

The regional project group to consider projects under the Agricultural Marketing and Research Bill met in the Experiment Station Building. Those attending as official representatives were:

Alabama	- Chas. F. Simmons, and T. Hayden Rogers
Florida	- F. H. Hull, F. B. Smith, L. O. Gratz, and R. A. Carrigan
Georgia	- O. E. Sell and G. W. Burton
Kentucky	- E. N. Fergus
Louisiana	- C. R. Owen
Mississippi	- P. G. Hogg and H. W. Bennett
N. Carolina	- R. W. Cummings and R. L. Lovvorn
S. Carolina	- Mack Drake and W. R. Paden
Texas	- George Warner and R. C. Potts
Tennessee	- L. N. Skold
Virginia	- T. J. Smith
U.S.D.A.	- M. A. Hein

Dr. Cummings had summarized the objectives set forth in the various state reports or projects. These objectives were discussed during the meeting as follows:

Title: The production and utilization of pastures and forage crops in the South.

Objectives: (1) To discover, introduce, and develop through breeding and selection new and improved strains, varieties and species of forage crops adapted to the southern region.

(2) To determine under controlled conditions the influence of environmental factors on the behavior of the various strains, varieties and species of forage crops developed for the South, and to determine the response of these plants to variations in environments encountered in the region and to soil management and fertilization practices.

(3) To determine the climatic and physiological factors affecting seed production and to develop improved methods of production, harvesting, processing, and storage of forage crop seed.

(4) To develop and apply suitable techniques for the evaluation of forage crops and pasture management and systems in terms of their potential contributions to the feed programs for the various classes of farm animals.

(5) To develop methods, machinery, and structures for greater efficiency in production and conservation of forage crops.

Justification:

The Southern Region is a livestock deficit area. This results not only in high consumer costs for livestock products but also a consumption of livestock products that is insufficient for the general health and welfare of the people. Productive pastures are recognized as the keystone in the development of an efficient livestock program.

Farmers in the Southern States have the lowest per capita income of any agricultural group in the United States. This low income results from low yields per acre, small farms, and inefficient utilization of much of the farm land. In most of the area a relatively low percentage of the total crop land is producing the major portion of the farm income. For example, in North Carolina the three cash crops - cotton, tobacco, and peanuts - produce 63.8 percent of the total crop value of 26.6 percent of the cultivated acreage. In Georgia the same three crops produce 50.7 percent from a corresponding 32.5 percent of the crop acreage. Cotton alone in Mississippi accounts for 62.4 percent of the crop value but is produced on 35.6 percent of the crop land.

More efficient utilization of the acreage now returning little or no income would greatly benefit the Southern farmers. Recent developments in corn production have demonstrated that the low acre yields can be increased several fold through the use of hybrids, heavier fertilization, shallow cultivation, and thicker spacing. As the corn yields are increased many acres previously planted to this crop will be released for forage and pasture crops. Also many idle or near idle acres can be used for the same purpose. This is imperative not only as a means of increasing feed production and supplementing the farm income but also in raising the nutritional standards of farm families and in the protection of soils from erosion.

The solution of the problems concerned in deriving the maximum benefits to the region from a forage crop program requires an intensive and coordinated effort to discover new and superior species of forage plants adapted to the region; to develop improved varieties of those species now available combining high yielding capacity with high palatability and nutritive value, resistance to diseases and insects, and adaptability to the less favorable environmental conditions; to develop methods of seed production, harvesting and processing which will make available ample supplies of locally produced seed; to determine the physiological, ecological, and management requirements of these species singly and in combination; to evaluate their usefulness in the total feed program of the different classes of livestock; and to develop moreefficient methods of production, harvesting, and utilization of these crops.

REGISTRATION LIST
Southern Pasture and Forage Crop
Improvement Conference

1947

ALABAMA

Harry Dearing	Tennessee Coal, Iron R. R.	Birmingham, Ala.
J. A. Naftel	Pacific Coast Borax	Auburn, Ala.
R. Q. Parks	Soils & Fertilizers, B.P.I.	Auburn, Ala.
M. B. Penn	Alabama Power Company	Birmingham, Ala.
Howard T. Rogers	Tennessee Valley Authority	Auburn, Ala.
T. Hayden Rogers	Agricultural Expt. Station	Auburn, Ala.
Charles F. Simmons	" " " " " "	" " "
Ernest H. Stewart	" " " " " "	" " "
D. A. Stukie	" " " " " "	" " "
Charles Summerour	American Potash Institute	Montgomery, Ala.
Bill Womack	Womack Farms	Ashford, Ala.

FLORIDA

R. B. Becker	Florida Experiment Station	Gainesville, Fla.
Fred Clark	" " " " " "	" " " "
Phares Decker	" " " " " "	" " " "
Henry C. Harris	" " " " " "	" " " "
H. B. Helms	Soil Conservation Service	" " " "
E. M. Hodges	Range Cattle Experiment Sta.	Ona, Florida
L. M. Hollingsworth	Farmers' Home Adm.	Gainesville, Fla.
Fred H. Hull	Florida Experiment Station	" " " "
L. P. V. Johnson	College of Agr., U. of Fla.	" " " "
G. B. Killinger	Florida Experiment Station	" " " "
G. E. Ritchey	U.S.D.A. Agr. Expt. Sta.	" " " "
Stuart Simpson	Simpson Nursery Company	Monticello, Fla.
R. L. Smith	Florida Experiment Station	DeFuniak Springs, Fla.
R. W. Wallace	" " " " " "	Monticello, Fla.
J. D. Warner	North Fla. Expt. Station	Quincy, Fla.
J. B. White	Florida Experiment Station	Wewahitchka, Fla.
B. F. Williamson	Agricultural Operator	Gainesville, Fla.

GEORGIA

E. D. Alexander	Georgia Extension Service	Athens, Georgia
Glenn W. Burton	U.S.D.A. Agr. Expt. Sta.	Tifton, Georgia
J. M. Elrod	Georgia Experiment Sta.	Griffin, Georgia
H. J. Hodgson	U.S.D.A. Agr. Expt. Sta.	Tifton, Georgia
Roy Komarck	Greenwood Plantation	Thomasville, Ga.
Paul C. Lemon	S.E. Forest Experiment Sta.	Tifton, Georgia
Andrew Mathews	Georgia Experiment Sta.	Tifton, " "
J. Cooper Morcoch, Jr.	Allied Chemical & Dye Corp.	Atlanta, " "
D. W. Parllee	P. O. Box 27	Thomasville, Ga.
T. B. Preston	Agricultural Extension Ser.	Athens, Ga.

Registration List,-Continued

GEORGIA

O. E. Sell	Georgia Experiment Station	Experiment, Georgia
J. W. Simons	Barrow Hall, U. of Georgia	Athens, Georgia
J. L. Stephens	U.S.D.A. Expt. Station	Tifton, Georgia

KENTUCKY

E. N. Fergus	Kentucky Agricultural Exp.Sta.	Lexington, Kentucky

LOUISIANA

C. R. Owen	Dept. Crops & Soils,Agr. Experiment Station	Baton Rouge, La.

MARYLAND

M. A. Hein	B.P.I. Forage Crops	Beltsville, Md.
E. A. Hollowell	" " " " "	" " " "
Roland McKee	" " " " "	" " " "

MISSISSIPPI

H. W. Bennett	Agricultural Expt. Sta.	State College, Miss.
P. G. Hogg	Delta Experiment Sta.	Stoneville, Miss.

NORTH CAROLINA

R. W. Cummings	N. C. Agr. Expt. Station	Raleigh, N. C.
C. H. Hanson	N. C. State College	" " " "
R. L. Lovvorn	N. C. Agr. Expt. Station	" " " "
Ben W. Smith	N. C. State College	" " " "
W. W. Woodhouse, Jr.	N. C. Agr. Expt. Station	" " " "

SOUTH CAROLINA

Mack Drake	S. C. Agricultural Expt. Sta.	Clemson, S. C.
E. B. Eskey	" " " " " " "	" " " "
W.H. Garman	" " " " " " "	" " " "
W. R. Paden	" " " " " " "	" " " "
J. J. Stroup	Soil Conservation Service	Spartansburg, S.C.
Paul Tabor	" " " " " "	" " " " "

TENNESSEE

J. Hugh Felts	Substation Superintendent	Greenville, Tenn.
John A. Odom	Plateau Experiment Sta.	Crossville, Tenn.
L. N. Skold	Tennessee Experiment Station	Knoxville, Tenn.

Registration List - Continued

TEXAS

R. C. Potts	Texas A & M College	College Station, Texas
W. F. Turner	Texas Sub-Station No. 3	Angleton, Texas
A. H. Walker	Texas Extension Service	College Station, Texas
George C. Warner	Texas Agr. Expt. Station	" " " " "

VIRGINIA

Roy B. Davis, Jr.	U.S.D.A.Agr. Expt. Sta.	Blacksburg, Va.
T. J. Smith	Virginia Expt. Station	" " " "

WASHINGTON, D. C.

E. J. Woolfolk	U. S. Forest Service	Washington, D.C.